

George Y. Chen

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Biography

George Y. Chen received his MEng degree in Electronics, Electrical and Computer Science from Imperial College London (UK) in 2009, and his Ph.D. degree from the Optoelectronics Research Centre at the University of Southampton (UK) in 2014. He worked with SPI Lasers Ltd. between 2013 and 2015. He is currently a research fellow in the School of Engineering and Future Industries Institute at the University of South Australia. He has published more than 20 refereed journal papers as first/corresponding author in photonics. His research interests cover point optical sensors (humidity, light, fiber defect, refractive index, bio/chemical), optical distributed sensors (humidity, light), resonators and interferometers, microfibers and nanofibers, ray optics modeling, fiber characterization, novel materials and coatings, fiber tapering, fs laser processing, and system automation.

Extremely fast and ultra-sensitive hygrometers for sensing and touchless control

The measurement and control of humidity is imperative for environments including medical (e.g. diagnostic tools, operating theatres, rehabilitation wards), manufacturing (e.g. glasses, coatings, optical fibers), agricultural (e.g. greenhouses, crop fields), food (e.g. baking, drying, storage) and buildings (e.g. museums, heritage buildings). Recent advances in humidity sensors that are both fast and sensitive are discussed. Optical sensors are inherently immune to electromagnetic interference. In-house fabricated planar optical sensor heads can reach a sensitivity of 310 nm/100%RH (e.g. 6×10^{-3} %RH detection limit). In-house developed fiber-optic sensor heads can achieve a response time of 3 ms, which is the fastest ever reported. A new type of touchless control based on humidity signals is also presented, which can compete against sound- and gesture-based technologies, with unique applications.